

PATENT SPECIFICATION

1,156,788

DRAWINGS ATTACHED.

Inventors:—ALFRED DICKENS BAKER and MAURICE ALBERT HENRY HOWES.

1,156,788



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COMPLETE SPECIFICATION.

Alternators.

We, JOSEPH LUCAS (INDUSTRIES) LIMITED, of Great King Street, in the City of Birmingham 19, a British Company, do hereby declare the invention, for which 5 we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to alternators.
10 An alternator according to the invention comprises in combination a casing carrying a stator and associated stator windings, a rotor, bearings mounting said rotor for rotation relative to said casing, said 15 rotor comprising a pair of parts supporting a field winding, and said pair of parts each having a plurality of fingers, the fingers on the two parts being interdigitated, and each of said fingers extending in a direction 20 which is generally inclined to the axis of said rotor, whereby said fingers draw air through the said casing as the rotor rotates.

One example of the invention is illustrated in the accompanying drawings 25 wherein Figure 1 is a fragmentary sectional view of an alternator for use in a road vehicle, Figure 2 is a side elevational view of the rotor of the alternator shown in Figure 1, and Figures 3 and 4 are perspective views respectively of parts of a 30 modification of the rotor shown in Figure 2, but shown reversed as compared with Figure 2.

Referring to Figures 1 and 2, the alternator includes a casing 11 which carries the 35 stator 12 and associated stator output windings 13 of the alternator, the casing further providing bearings 14 for a shaft 16 which is rotated by the engine of the 40 vehicle with which the alternator is associated. The alternator further includes an

interdigitated rotor 17 having a splined connection with the shaft 16, the rotor 17 carrying the field winding 18 of the alternator. Current is supplied to the winding 18 by way of brushes 15, the output from the alternator being regulated by a voltage regulator (not shown) controlling the current flow in the winding 18. The output from the windings 13 is rectified to provide a d.c. output from the alternator.

The rotor 17 is of two part construction having front and rear parts 19, 21 respectively, the parts 19, 21 both having a splined connection with the shaft 16. The rear part 21 includes an annular disc 22 having spaced around the periphery thereof a plurality of integral fingers 23. Also integral with the disc 22 and centrally disposed thereon is an axially extending hollow stub 24 upon which the winding 18 is supported. The part 19 comprises an annular disc 25 having spaced around the periphery thereof a plurality of integral fingers 26 equal in number to the fingers 23. The arrangement is such that when the parts 19, 21 are assembled on the shaft 16 the fingers 23, 26 will be interdigitated and the winding 18 will be disposed in the annular space defined between the discs 22, 25, the stub 24 and the fingers 23, 26. The parts 19, 21 are machined so that when the rotor is assembled the outermost surfaces of the fingers 23, 26 constitute parts of the surface of an imaginary cylinder coaxial with the shaft 16.

In prior rotor constructions the fingers 23, 26 of the rotor extend axially with respect to the rotor and so do not draw air through the casing of the alternator. However, in the present construction the fingers are each inclined with respect to an axially

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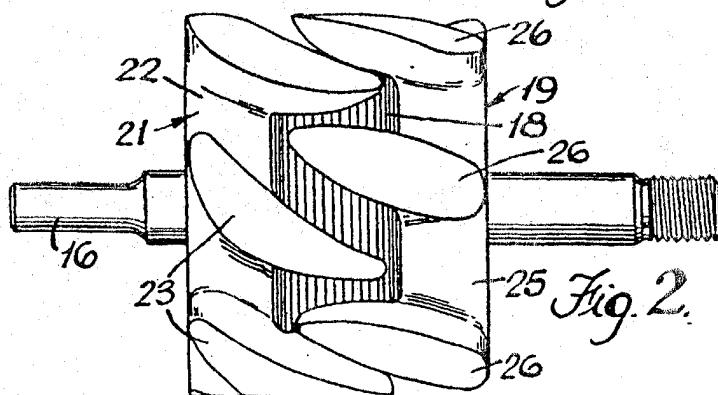
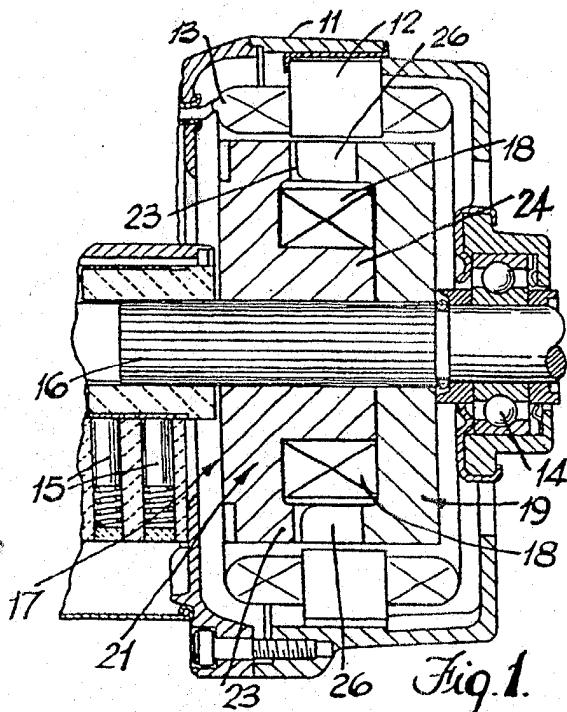
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COMPLETE SPECIFICATION

2 SHEETS

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the Original on a reduced scale*

Sheet 1



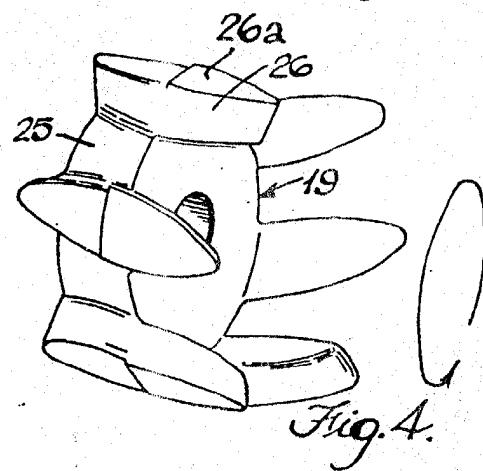
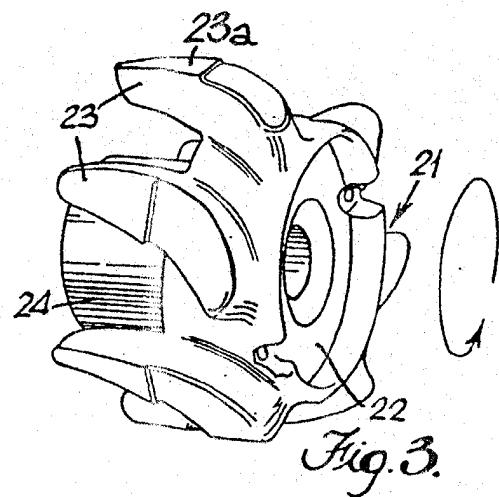
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COMPLETE SPECIFICATION

2 SHEETS

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Sheet 2



extending line on the surface of the imaginary cylinder generated by rotation of the rotor and therefore they draw air through the alternator casing when the rotor is rotated. In the preferred embodiment the fingers are also curved as shown in Figure 2 to increase the rate at which air is drawn through the casing. The shape of the fingers 26 is so chosen that they fit between the fingers 23 when the rotor is assembled and complete the magnetic circuit.

In the modified rotor shown in Figures 3 and 4 the fingers of both of the parts 19, 21 are formed with raised portions 23a, 26a respectively. Only the portions 23a, 26a need be machined in use to conform to the internal shape of the stator of the alternator and thus the amount of machining required by the rotor in Figures 3 and 4 is reduced as compared with that required by the rotor in Figure 2 wherein the whole of the outer surfaces of the fingers are machined.

25 **WHAT WE CLAIM IS:—**

1. An alternator comprising in combination a casing carrying a stator and associated stator windings, a rotor, bear-

ings mounting said rotor for rotation relative to said casing, said rotor comprising a pair of parts supporting a field winding, and said pair of parts each having a plurality of fingers, the fingers on the two parts being interdigitated, and each of said fingers extending in a direction which is generally inclined to the axis of said rotor, whereby said fingers draw air through the said casing as the rotor rotates.

2. An alternator as claimed in claim 1 wherein the outer surface of the free end of each finger is formed with a raised portion which is machined to conform to the internal shape of the stator of the alternator.

3. An alternator comprising the combination and arrangement of parts substantially as described with reference to Figures 1 and 2 of the accompanying drawings.

4. An alternator as claimed in claim 3, modified substantially as described with reference to Figures 3 and 4 of the accompanying drawings.

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